



[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 23

[Docket No. FAA-2015-0723; Special Conditions No. 23-264-SC]

Special Conditions: Honda Aircraft Company (Honda) Model HA-420, HondaJet; Full Authority Digital Engine Control (FADEC) System.

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions; request for comments.

SUMMARY: These special conditions are issued for the Honda Aircraft Company HA-420 airplane. This airplane will have a novel or unusual design feature associated with the use of an electronic engine control system instead of a traditional mechanical control system. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: The effective date of these special conditions is **[INSERT DATE OF**

PUBLICATION IN THE FEDERAL REGISTER], and is applicable on March 25, 2015.

We must receive your comments by **[INSERT DATE 30 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]**

ADDRESSES: Send comments identified by docket number [FAA-2015-0723] using any of the following methods:

- ☐ Federal eRegulations Portal: Go to <http://www.regulations.gov> and follow the online instructions for sending your comments electronically.
- ☐ Mail: Send comments to Docket Operations, M-30, U.S. Department of Transportation (DOT), 1200 New Jersey Avenue, SE., Room W12-140, West Building Ground Floor, Washington, D.C., 20590-0001.
- ☐ Hand Delivery of Courier: Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, S.E., Washington, D.C., between 9 a.m., and 5 p.m., Monday through Friday, except Federal holidays.
- ☐ Fax: Fax comments to Docket Operations at 202-493-2251.

Privacy: The FAA will post all comments it receives, without change, to <http://regulations.gov>, including any personal information the commenter provides. Using the search function of the docket web site, anyone can find and read the electronic form of all comments received into any FAA docket, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). DOT's complete Privacy Act Statement can be found in the Federal Register published on April 11, 2000 (65 FR 19477-19478), as well as at <http://DocketsInfo.dot.gov>.

Docket: Background documents or comments received may be read at <http://www.regulations.gov> at any time. Follow the online instructions for accessing the docket or go to the Docket Operations in Room W12-140 of the West Building Ground Floor at 1200

New Jersey Avenue, SE., Washington, D.C., between 9 a.m., and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: John G. VanHoudt, Federal Aviation Administration, Aircraft Certification Service, Small Airplane Directorate, ACE-111, 901 Locust, Kansas City, Missouri 64106; 816-329-4142, fax 816-329-4090.

SUPPLEMENTARY INFORMATION:

The FAA has determined, in accordance with 5 U.S. Code §§ 553(b)(3)(B) and 553(d)(3), that notice and opportunity for prior public comment hereon are unnecessary because the substance of these special conditions has been subject to the public comment process in several prior instances with no substantive comments received. The FAA therefore finds that good cause exists for making these special conditions effective upon issuance.

<u>Special Condition Number</u>	<u>Company/Airplane Model</u>
<u>23-237-SC</u>	Spectrum Aeronautical Model S-40
<u>23-246-SC</u>	Cirrus Design Corporation Model SF50
<u>23-253-SC</u>	Diamond Aircraft Industries Model DA-40NG

Comments Invited

We invite interested people to take part in this rulemaking by sending written comments, data, or views. The most helpful comments reference a specific portion of the special conditions, explain the reason for any recommended change, and include supporting data. We ask that you send us two copies of written comments.

We will consider all comments we receive on or before the closing date for comments. We will consider comments filed late if it is possible to do so without incurring expense or delay. We may change these special conditions based on the comments we receive.

Background

On October 11, 2006, Honda Aircraft Company applied for a type certificate for their new Model HA-420. On October 10, 2013, Honda Aircraft Company requested an extension with an effective application date of October 1, 2013. This extension changed the type certification basis to amendment 23-62.

The HA-420 is a four to five passenger (depending on configuration), two crew, lightweight business jet with a 43,000-foot service ceiling and a maximum takeoff weight of 9963 pounds. The airplane is powered by two GE-Honda Aero Engines (GHAE) HF-120 turbofan engines.

The HA-420 airplane will use an electronic engine control system (FADEC) instead of a traditional mechanical control system. Even though the engine control system will be certificated as part of the engine, the installation of an engine with an electronic control system requires evaluation due to critical environmental effects and possible effects on or by other airplane systems. For example, indirect effects of lightning, radio interference with other airplane electronic systems, shared engine and airplane data and power sources.

The regulatory requirements in 14 CFR part 23 for evaluating the installation of complex systems, including electronic systems and critical environmental effects, are contained in § 23.1309. However, when § 23.1309 was developed, the use of electronic control systems for engines was not envisioned. Therefore, § 23.1309 requirements were not applicable to systems

certificated as part of the engine (reference § 23.1309(f)(1)). Parts of the system that are not certificated with the engine could be evaluated using the criteria of § 23.1309. However, the integral nature of these systems makes it unfeasible to evaluate the airplane portion of the system without including the engine portion of the system.

In some cases, the airplane that the engine is used in will determine a higher classification than the engine controls are certificated for; requiring the FADEC systems be analyzed at a higher classification. As of November 2005, FADEC special conditions mandated the classification for § 23.1309 analyses for loss of FADEC control as catastrophic for any airplane using FADEC. This is not to imply an engine failure is classified as catastrophic, but that the digital engine control must provide an equivalent reliability to mechanical engine controls.

Type Certification Basis

Under the provisions of 14 CFR 21.17, Honda Aircraft Company must show that the HA-420 meets the applicable provisions of part 23, as amended by amendments 23-1 through 23-62, thereto.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 23) do not contain adequate or appropriate safety standards for the model HA-420 because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

In addition to the applicable airworthiness regulations and special conditions, the HA-420 must comply with the fuel vent and exhaust emission requirements of 14 CFR part 34 and the noise certification requirements of 14 CFR part 36. In addition, the FAA must issue a finding of regulatory adequacy pursuant to § 611 of Public Law 92-574, the "Noise Control Act of 1972."

The FAA issues special conditions, as defined in § 11.19, under § 11.38 and they become part of the type certification basis under § 21.17(a)(2).

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same novel or unusual design feature, the special conditions would also apply to the other model under the provisions of § 21.101(a)(1).

Novel or Unusual Design Features

The HA-420 will incorporate the following novel or unusual design features:

Electronic engine control system.

Discussion

As defined in the summary section, this airplane makes use of an electronic engine control system instead of a traditional mechanical control system is a novel design for this type of airplane. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. Mandating a structured assessment to determine potential installation issues mitigates the concerns that the addition of a full authority engine controller does not produce a failure condition not previously considered.

Applicability

As discussed above, these special conditions are applicable to the model HA-420. Should Honda Aircraft Company apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features on the model HA-420 airplanes. It is not a rule of general applicability and it affects only the applicant who applied to the FAA for approval of these features on the airplane.

The substance of these special conditions has been subjected to the notice and comment period in several prior instances, identified above, and has been derived without substantive change from those previously issued. It is unlikely that prior public comment would result in a significant change from the substance contained herein. Therefore, notice and opportunity for prior public comment hereon are unnecessary and the FAA finds good cause, in accordance with 5 U.S. Code §§ 553(b)(3)(B) and 553(d)(3), making these special conditions effective upon issuance. The FAA is requesting comments to allow interested persons to submit views that may not have been submitted in response to the prior opportunities for comment described above.

List of Subjects in 14 CFR Part 23

Aircraft, Aviation safety, Signs and symbols.

Citation

The authority citation for these special conditions is as follows:

Authority: 49 U.S.C. 106(g), 40113 and 44701; 14 CFR 21.16 and 21.17; and 14 CFR 11.38 and 11.19.

The Special Conditions

Accordingly, pursuant to the authority delegated to me by the Administrator, the following special conditions are issued as part of the type certification basis for Honda Aircraft Company model HA-420 airplanes.

1. Electronic Engine Control

a. The installation of the electronic engine control system must comply with the requirements of § 23.1309(a) through (d) at amendment 23-62. The intent of this requirement is not to reevaluate the inherent hardware reliability of the control itself, but rather determine the effects, including environmental effects addressed in § 23.1306 and 23.1308 on the airplane systems and engine control system when installing the control on the airplane. When appropriate, engine certification data may be used when showing compliance with this requirement; however, the effects of the installation on this data must be addressed.

b. For these evaluations, the loss of FADEC control will be analyzed utilizing the threat levels associated with a catastrophic failure.

Issued in Kansas City, Missouri on March 25, 2015.

Pat Mullen

Acting Manager, Small Airplane Directorate

Aircraft Certification Service

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